

OVARICTOMY BY ENUCLEATION.

BY

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PROFESSOR OF SPECIAL AND CLINICAL SURGERY IN THE MEDICAL DEPARTMENT OF THE
UNIVERSITY OF BUFFALO.

EXTRACTED FROM THE TRANSACTIONS OF THE
INTERNATIONAL MEDICAL CONGRESS,
PHILADELPHIA, SEPTEMBER, 1876.



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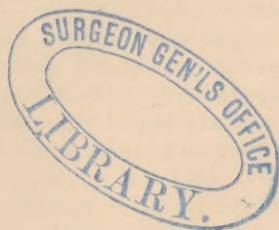
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OVARIOTOMY BY ENUCLEATION.

It is now about seven years since I announced to the profession that ovarian tumors could be removed by enucleation, and invited my professional friends to make trial of the proposed plan, describing, as well as I could, what I had done and the conclusions I had formed.¹ The idea that a tumor having such large arterial supply, could be removed without clamp, ligature, or cautery, though at first startling, received considerate attention, and, both in this country and in Europe, its successful results have led some of the most distinguished operators, not only to make trial of it, but to speak of it in high terms of commendation.

From the numerous reports and papers upon the subject, I discover that the exact manner of enucleation is not yet distinctly understood; some have spoken of a *clamp* after enucleation, others have spoken of cutting, the very thing that is to be avoided, while others still have limited the detachment of the pedicle to two or three inches above its base, thus showing me that I have never been fully understood as to the method of removing ovarian tumors by enucleation, a plan which, my experience convinces me, if properly understood and executed, possesses advantages over all others, and is of almost universal application.

It is well known that the ovarian tumor is surrounded by a peritoneal covering; that the pedicle, proper, usually divides into three or four parts, passing up over the walls of the tumor in bands of variable width; which contain vessels, often of large size, and which gradually diminish in thickness and in the size of the contained vessels, until finally they are lost in simple thickened portions of peritoneal covering. The peritoneal investment is not closely attached to the cyst, but separates readily, just as the peritoneum separates elsewhere in the pelvic cavity, being immediately lined by the subserous cellular tissue; thus no vessels of any considerable size enter the cyst. The tumor separates from its attachments with remarkable readiness, so much so that, in several instances, it is reported to have escaped the grasp of the operator and fallen spontaneously from the pedicle, accident thus plainly indicating the natural and proper method of removal.² The capillary vessels thus broken do not bleed, for the band contracts, and corrugates the larger trunks, while the broken-off capillaries ooze a little for only a minute or two, and a dry napkin, applied for a short time, is all that is required. The fear of hemorrhage is wholly unfounded, and I now say, without hesitation, that the danger of bleeding after this mode of proceeding is vastly less than the danger of slipping of clamp or ligature, in other methods in which

¹ Buffalo Medical and Surgical Journal, June, 1869.

² British Medical Journal, Nov. 26, 1870, p. 577; Braithwaite's Retrospect, July, 1871, p. 212.

the vessels are divided in their trunks. In this they are separated only in their extreme branches, and cannot give troublesome hemorrhage; it is seldom that any vessels are torn large enough to be seen as vessels or points of hemorrhage, and torsion is all that can be required in almost any case. If care is taken not to wound the vessels with either trocar, knife, or scissors, there will be no bleeding.

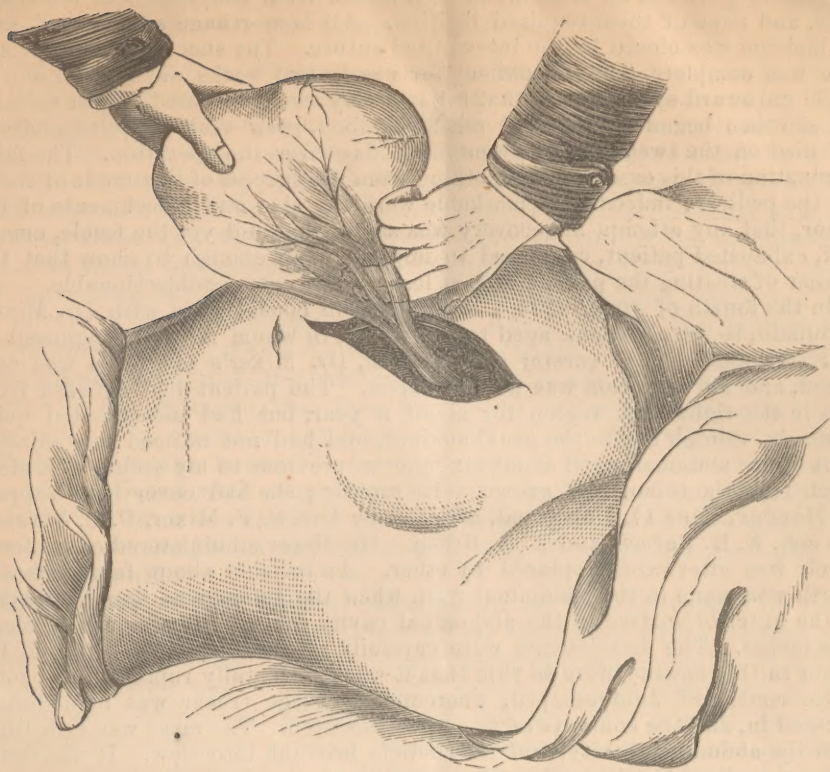
The tumor being removed, the operation is completed; there is no clamp to be used, for there is nothing to clamp; the pedicle requires no attention except to be carefully handled, and to be restored, as nearly as possible, to its original place; if the usual conditions are present, no drainage is necessary; and the incision may be closed as accurately as possible.

The bands referred to are to be grasped where they commence to diverge, raised from the cyst, and traced out to their terminations, often nearly around to the opposite side; the cyst is thus separated from its vascular supply, which is contained in these bands, other attachments being separated in the usual manner. Care must be taken not to wound or divide the vessels in their trunks, and, although the attachments will be found at points very strong, they can be forced off, or even with care a small piece of the cyst may be left attached to the pedicle, and no harm result, for it has a vascular supply, and is living tissue like the pedicle itself.

The method of enucleation has the further advantage that if upon trial it is for any reason thought impracticable, a clamp may be still applied, or the pedicle may be cauterized or tied with a ligature just as well as if enucleation had not been attempted. Few rules in surgery have no exceptions, and, though I believe that all ovarian tumors can be, and should be, removed by this simple method, supplemented when necessary by torsion or ligature to small vessels which bleed, still, to provide for all possible contingencies, I would assure the operator that a trial of enucleation is no hinderance to the subsequent adoption of any other plan that may be preferred, so that, while everything may thus be gained, nothing can be lost.

The accompanying cut, from a drawing by Dr. Edward N. Brush, who has several times assisted me in operating, will give a very fair idea of the procedure. The fingers of the operator are represented beneath a vascular portion of the pedicle, separating it from the walls of the tumor. This separation, as has before been observed, is to be carefully made, until the vessels are traced to their termination. To make the illustration plainer, the tumor is represented as raised from the abdominal cavity and supported by the hand of an assistant, but, of course, where extensive adhesions are present, this is impossible, and the risks of removal are greatly augmented. Formerly the operation in such cases was abandoned. When adhesions exist, they are to be separated, and the process continued to the pedicle.

There is no need to point out the advantages of this plan. Those who have studied the history of ovariectomy, and who are familiar with the difficulties and objections which may fairly be urged against the ordinary methods of procedure, will at once perceive that, if enucleation is successful, there is no pedicle to keep open the lower angle of the wound or to drag upon the parts—no unfavorable adhesions of the pedicle, no wires to be discharged by suppuration, and no crusts of burned tissue to be provided for. The abdominal cavity has simply been opened, and the diseased part removed; all that is left behind is capable of life.



It has been supposed that enucleation was designed exclusively for cases of extensive adhesion or short pedicle, in which no other plan could be adopted, thus lessening the number of incompleting operations. Certainly the method is adapted to such cases, but, instead of being reserved as a last resource, it should be chosen first, and the case regarded as most favorable in which it can be successfully accomplished. My surgical friends who have seen the operation, unite in regarding it as the most natural surgical procedure possible. To see it, is to be convinced of its entire feasibility and safety, while its advantages are too apparent to require a moment's consideration.

The following case first attracted my attention to this mode of treatment. I was invited to remove an immense tumor from the person of Mrs. Foster, of Cattaraugus County, N. Y. It was of many years' standing, and had been repeatedly tapped, but at length its contents became too thick to be drawn through the largest sized canula, and the patient's distress too great for endurance. The tumor was multilocular and very large, weighing, as nearly as could be ascertained, almost one hundred pounds. It was attached, throughout its entire circumference, to the omentum, intestines, walls of the abdomen, and all other parts with which it came in contact. These attachments were not so firm but that they could be broken up, and, with great care, the tumor was separated from the surrounding parts until the pedicle was reached. The process of enucleation had been carried on so extensively and successfully that encouragement was afforded for its continued trial; the pedicle was large, and extended over a wide surface, but by gentle and patient effort it was separated from its entire attachment to the tumor, and the immense growth removed without the use of a single ligature. The terminal branches of the vessels of

the pedicle gave out no more blood than issued from the vessels of the adhesions, and none of them required ligation. All hemorrhage soon ceased, and the incision was closed by the interrupted suture. The success of this procedure was complete, and the patient for nearly two weeks did not present a single untoward symptom, so that her recovery was considered almost certain. But she then began to lose her relish for food, grew weak and desponding, and died on the twentieth or twenty-first day after the operation. The fatal termination of this case detracts nothing from the success of this mode of treating the pedicle; indeed, so remarkable were the size and attachments of the tumor, that any attempt at recovery was surprising, and yet the feeble, emaciated, exhausted patient, continued to improve long enough to show that the manner of treating the pedicle was, at least in her case, unobjectionable.

On the fourth of June, 1873, I was called, in consultation with Dr. Mixer, of Buffalo, to see a patient, aged twenty-three, in whom he had diagnosed an ovarian tumor. After careful examination, Dr. Mixer's diagnosis was confirmed, and an operation was decided upon. The patient had suffered from pain in the right iliac region for about a year, but had menstruated quite regularly, though not to the usual amount, and had not noticed any enlargement of the abdomen until about six months previous to my seeing her, since which time the tumor had grown quite rapidly; she had never been tapped. On Monday, June 17, I operated, assisted by Drs. S. F. Mixer, C. C. Wyckoff and son, E. R. Barnes, and E. N. Brush. Dr. Mixer administered chloroform, which was afterwards replaced by ether. An incision about four inches in length was made in the abdominal wall, when the tumor was found adherent to the anterior surface of the abdominal cavity for a circumference of about nine inches. The attachments were carefully separated, but the walls of the tumor in this locality were so thin that it was accidentally ruptured, and some of its contained fluid escaped, whereupon a large trocar was immediately plunged in, and the contents of the cyst evacuated. The mass was now lifted from the abdominal cavity, and the pedicle brought into view. It was found to be of medium length, and its vessels were spread out over the tumor. I next introduced my finger beneath the central portion of the pedicle, at its least vascular part, between it and the sac, and by gentle manipulation separated it from the cyst. Two vessels only bled sufficiently to attract attention, and these were easily controlled by torsion. All further hemorrhage soon ceased on exposure of the part to the air, and, the cavity of the abdomen having been sponged out, the pedicle was returned without the application of a single ligature or other mechanical means to prevent bleeding. The slight oozing of blood caused by the separation of the adhesions from the abdominal wall ceased spontaneously. The wound was closed with the interrupted silver suture, supported by adhesive plaster, and warm flannel cloths were applied with bandages over the abdomen. The tumor was multilocular, and weighed eighteen pounds. On recovering from the anæsthesia, the patient complained of nausea, and vomited frequently. One-fourth of a grain of morphia was administered by hypodermic injection, and repeated once in four hours, and the patient was also given brandy and beef-tea. The following is a report of her condition as I found it on seeing her occasionally with Dr. Mixer. The temperature was not taken.

June 17, evening; pulse 120.

June 18, morning; pulse 108; vomiting at night.

June 19, morning; pulse 108; less vomiting.

June 20, morning; pulse 98; no vomiting; slept well; urinated without the use of the catheter; no swelling nor tympanites; wound was healing rapidly.

June 21; pulse 94; no symptoms of constitutional disturbance; slept and ate well.

June 24; pulse 84.

June 27; stitches removed; patient well.

During the whole course of recovery the patient declared that, with the ex-

ception of the nausea experienced during the first two or three days after the operation, she felt better than at any time just previous.

The pedicle in this case was of medium length, but too short to admit of its being brought out of the wound and secured by a clamp, without dragging upon the uterus, especially if any portion of it had been taken away with the tumor, as is the case when it is severed by the knife in the ordinary mode of performing ovariectomy. The vessels of the pedicle were large, and could be felt to pulsate plainly; and it is doubtful whether severing these with the cautery would have controlled the hemorrhage. Silk and metal ligatures have been employed successfully in many cases, and have been left in the cavity of the abdomen without producing any ill effects. Their employment, however, leaves within the peritoneum a foreign substance, which in most cases cannot but produce more or less inflammation, and any method which will allow the return of the pedicle to the abdomen, free from sources of irritation, must meet with approval. The question has been asked: "Can the pedicle be easily separated from the tumor?" In the case just narrated, the separation was accomplished with as great facility as attends the separation of cystic growths from surrounding parts in other portions of the body, and was easier, in fact, than was the detachment of the adhesions from the abdominal walls.

Prof. Logan, of the Medical Department of the University of Louisiana, in a private letter, speaking of an operation which he had performed for the removal of an ovarian tumor, the solid portion of which weighed sixteen and a half pounds, says:—"I was surprised at the facility with which the enucleation was effected; not a single vessel of sufficient size to throw a jet of blood presented itself, and no ligatures were, of course, required." In this case also, there was a rapid convalescence, with not a single bad symptom.

Upon these and similar facts is based the suggestion that the pedicle can, in ovariectomy, in some cases at least, be separated without ligature or cautery, thus avoiding many of its dangers. At first, this proposition may appear startling, and surgeons who have tied large vessels in the operation, or who have witnessed the fearful hemorrhage which sometimes takes place from the slipping of the clamp or ligatures, may regard it with some surprise, and may perhaps, without trial, look upon it as wholly impracticable; I should myself, probably, hold such an opinion, had I not had the opportunity of demonstrating to myself its entire feasibility.

An ovarian tumor is generally composed of a firm dense cyst, containing fluid of varied color and composition. It may, or may not, have a solid portion, but usually it does have more or less of a body, the remnant of an enlarged or degenerated gland. Upon the surface of this cyst is spread out the vascular, fibrous, cellular, and other tissues which compose the pedicle, but only the terminal branches of the vessels enter the cyst wall; the vessels may be quite large at their origin, but soon they are numerously divided, and enter the cyst, if at all, only when of capillary size. The attachment of the pedicle to the cyst is more easily broken than any one would imagine who had not tried the experiment in the manner described, and I am confident that the same efforts which are made to break up the adhesions to the peritoneum, omentum, and other parts, would, if extended to the pedicle, many times be equally successful.

If this method can be adopted without hemorrhage or other difficulty, its advantages are apparent. The pedicle can then be returned to the abdominal cavity without any of the objections which have been urged against this procedure. There is no ligature to be discharged by ulcerative process, or to become encysted, or to induce inflammation. There are no purulent or inflammatory products to be in any way removed or provided for; the pedicle is wholly living tissue, and has no irritative qualities which render its return to the abdominal cavity objectionable.

My object will have been wholly accomplished if the feasibility of enucleation in ovariectomy has been shown with sufficient clearness to insure a trial of the method by other surgeons.

DISCUSSION ON DR. MINER'S PAPER.

After the reading of the preceding paper, the President, Dr. ROBERT BARNES, of London, said:—I am glad to hear the paper, as I was the first to introduce the method of enucleation into England. I think it a good method, but it cannot wholly supersede other modes of dealing with the pedicle. In some cases, enucleation is the only mode of removal practicable; but these are exceptions to the rule. I must say that I do not share Dr. Miner's dread of leaving silk and silver ligatures in the peritoneal cavity, for I have frequently seen them left there without mischief. I have also seen the perchloride of iron used to sponge bleeding points left after the sundering of strong adhesions, and without any of those formidable results which some writers attribute to its passage through the Fallopian tubes after intra-uterine injections. In ovariectomy, the great thing is security against hemorrhage; and that, I think, is best gained by the use of the clamp or the ligature. The operation of ovariectomy demands still more study than has been given to it, and I congratulate Dr. Miner upon having very materially added to the stock of knowledge regarding it.

Dr. JAMES P. WHITE, of Buffalo, said:—I am cognizant of twenty or thirty cases in which enucleation has been used. It is not a very difficult operation, but in some cases it is impossible—for instance, where the growth of the tumor has been rapid and the pedicle is short and large. In these cases, the cyst cannot be safely enucleated. I have no doubt, however, that enucleation is often the best method of treating ovarian tumors, but the subject merits a great deal of study and consideration, and the cautery, the clamp, the ligature, and enucleation, all deserve attention, and should be severally used according to the special indications of individual cases.

Dr. E. R. PEASLEE, of New York, said:—We should not confine ourselves to any one method of treatment in the removal of ovarian cysts. Nor is enucleation always feasible. In some cases, short and large vessels enter into the cyst directly from the pelvis, and do not become capillary. In these, enucleation will not answer, because it cannot arrest the hemorrhage. Such an instance I have met with, and the patient bled to death. Again, owing to the thinness and the friability of the cyst-wall, it will sometimes break down before the adhesions can be broken up. But I feel under great obligations to Dr. Miner for introducing this method, for I have removed tumors by enucleation, which I am confident could have been removed in no other way. In most cases the ligature can be used, and I then see no particular advantage to be gained by enucleation. But I would adopt it in cases of cysts adherent to the liver. I am myself inclined to the use of the ligature, which I generally cut close. As I have only once seen the pedicle slough, I do not share Dr. Miner's fears on that score.

Dr. G. KIMBALL, of Lowell, Mass., said:—I have tried enucleation but once, but believe that I might have saved some lives had I known of this method earlier in my practice. I feel very much indebted to Dr. Miner for his suggestions on this subject. Dr. Keith's great success has been obtained with the cautery, and I think that the profession is still at sea as to the proper method of dealing with the pedicle. I myself generally use the clamp, but I adapt the treatment to the particular case.

Dr. WHITE said:—As a rule, I prefer cauterization, because it leaves fewer foreign bodies in the cavity of the abdomen; and I am sure that,

in my practice, I have seen as many children born from women who have lost one ovary as I have lost cases of ovariectomy. I think that the treatment of these tumors should be eclectic, and that each case should be separately studied with a view to its treatment.

Dr. ALEXANDER R. SIMPSON, of Edinburgh, said:—In regard to the application of the cautery, Dr. Keith has used it very successfully; personally, I am ready to use any method that the case may demand. The great strength of Dr. Keith lies in the thorough preparation of his cases, and in the care which he takes with them. There is always a difference in operators, and Dr. Keith does not consider minutes wasted that will prevent hemorrhage into the peritoneal cavity.

Dr. THEOPHILUS PARVIN, of Indianapolis, said:—Enucleation is of use when the pedicle is too short for the clamp. I have had two cases: one complicated with pregnancy was attended by considerable hemorrhage. This I checked by the application of flannels dipped in hot water. In such cases I can recommend hot water, and I referred to the same agent in the discussion of yesterday on uterine hemorrhage. I think, contrary to Dr. Miner's statement, that it is settled that there is no peritoneal coat to an ovarian tumor, as there is no peritoneal covering to the ovary itself.* Enucleation is of value where there are peritoneal adhesions, but I believe that it can be very often dispensed with by the use of hot water. I recognize its advantages, but do not think that it is the only treatment for ovarian tumors.

Dr. MINER, in reply, said:—I agree that possibly in some cases enucleation may not be of service, and that torsion, the ligature, and even the cautery may have to be used. But in ordinary cases of ovarian tumor, I deem it to be a plain piece of surgery; and I have myself never seen a case in which the cyst could not have been removed by enucleation. Where there is bleeding, I resort to torsion; but enucleation does not interdict the subsequent use of the clamp, the ligature, or the hot iron.

* "The ovary is invested by peritoneum, excepting along its anterior attached margin."—*Gray's Anatomy*, Page 818.

"The ovary is invested by the peritoneum, except at its sharp or lower edge." *Theory and Practice of Obstetrics*, by Wm. Byford, A. M., M. D., page 37.

"Situated on the posterior aspect of the broad ligament, each is invested with a fold of peritoneum derived from it." *Manual of Midwifery*, by Alfred Meadows, M. D., Lond. page 47.

"This membrane—the tunica albuginea—is closely invested by the peritoneum, except at one point, the hilus, through which nerves and blood-vessels enter the ovaries." *Principles and Practices of Obstetrics*, by Gunning S. Beaford, A. M., M. D., page 90.

"When the peritoneal layers pass downwards and backwards from the fimbriated extremity of the Fallopian tube to meet and invest the ovaries, there etc." *Diseases of Women*, by Sir James Y. Simpson, M. D., page 395.

"The surface of the ovary is not covered by peritoneum, for, arrived at the circumference of these organs this membrane loses its characteristic appearances, and the only trace of it which is discoverable is a layer of basement epithelium." *Diseases of Women*, Third Edition, by T. Gaillard Thomas, M. D., page 625.

